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| APPLICATION NO.  | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|---------------------|------------------|
| 10/783,979   | 02/20/2004  | Shintaro Asuke       | 9319S-000648        | 4405             |
| 27572  | 7590        | 04/18/2007           | EXAMINER            |                  |
| HARNESS, DICKEY & PIERCE, P.L.C.<br>P.O. BOX 828<br>BLOOMFIELD HILLS, MI 48303 |             |                      | LAZORCIK, JASON L   |                  |
|  |             | ART UNIT             | PAPER NUMBER        |                  |
|  |             | 1731                 |                     |                  |

| SHORTENED STATUTORY PERIOD OF RESPONSE | MAIL DATE  | DELIVERY MODE |
|--|------------|---------------|
| 3 MONTHS                               | 04/18/2007 | PAPER         |

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

|                              |                        |                     |  |
|------------------------------|------------------------|---------------------|--|
| <b>Office Action Summary</b> | <b>Application No.</b> | <b>Applicant(s)</b> |  |
|                              | 10/783,979             | ASUKE ET AL.        |  |
|                              | <b>Examiner</b>        | <b>Art Unit</b>     |  |
|                              | Jason L. Lazorcik      | 1731                |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 09 January 2007.
- 2a) This action is FINAL.                  2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1,2,4,6 and 8 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1, 2, 4, 6, and 8 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All    b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____.   | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1, 4, 6, and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura (US 6,921,148).

With particular respect to Claims 1 and 6, Nakamura teaches a method of manufacturing the substrate of a display device wherein the substrate is selectively held by a carrier and carried along the carry direction (column 76, Lines 37-41) and through various process chambers wherein the object is subjected to sequential different treatments. As with any apparatus, the individual chambers may be disassembled and replaced at will.

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Nakamura fails to explicitly indicate that the treatment surface faces downward and that the treatment units are operated upward. Nakamura however sets forth the fundamental process steps in accord with the claimed invention and an apparatus for the performance of these steps. In the absence of any unexpected results, it would have been obvious to one of ordinary skill in the art at the time of the invention to operate the disclosed apparatus in any orientation as chosen according to the discretion of the operator.

With respect to Claims 4 and 8 and in light of the rejections of Claim 1 and 6 as set forth above, Nakamura teaches a plasma processing process (Column 76, Lines 7 to Column 80, Line13) which reads on the claimed cleaning treatment unit and surface modification treatment unit. The disclosed liquid drop discharge process (column 86line65 – Column 87, line12), the drying process (Column 87, line 42-43), and the heat processing step (Column 88, lines35-40) are understood to read upon the liquid agent application treatment unit, drying treatment unit, and annealing treatment unit, respectively.

Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura (US 6,921,148) as applied to claim 1 above, and further in view of Goodwin (US 5,324,155). Nakamura is silent regarding the structural details of the transport device and therefore fails to teach that the transport device described for transferring the substrate between treatment chambers should provide a suction portion to suction and hold the surface targeted for holding, which is opposite the surface targeted for treatment. Nakamura further fails to explicitly indicate that transport device (855)

comprises a guide component for guiding the holding portion in the carrying direction and a driving portion for transferring the holding portion along the guide component. Goodwin teaches a wafer handling system including a pair of robot arms and a drive portion with a plurality of ports providing a lifting action for a substrate by utilizing the Bernoulli principle. The device provides "low pressure" or a suction between the device and the surface of the substrate without contacting the substrate. It would have been obvious to one of ordinary skill in the art at the time of the invention to utilize a handling system in accord with the Goodwin apparatus as the transport device in the Nakamura process. This would have been an obvious substitution to anyone seeking to minimize the possibility of damaging a fragile substrate by direct contact with the handling system or transport device.

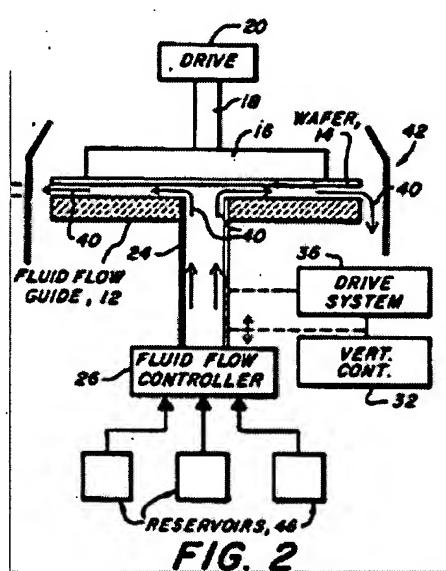
Claims 1, 2, 4, 6, and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cady (US 4,544,446).

With particular reference to the instant reference figure 2 (see below), Cady teaches a treatment device for subjecting a surface of a substrate targeted for treatments to continuous plural types of treatments. Specifically, the reference teaches a substrate carrier (16) with treatment units (46).

As clearly depicted in the figure, the substrate surface targeted for treatment faces downward and the plural treatment units are operated upward to treat said targeted surface. A suction portion (16) or "vacuum chuck" holds a "surface targeted for holding" opposite the surface targeted for treatment and said suction portion is further interconnected with "a guide component" (18) and "a driving portion" (20) [Claim 2]. It is

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further evident that the fluid having been applied to the surface falls away (40) after having been applied to the surface.



With reference to the above figure, Cady sets forth that "it will be appreciated that the entire apparatus may be inverted such that the wafer is suspended from the top via vacuum chuck 16. The inverted system has the advantages of protecting the surface of the substrate from being contaminated by any particulates in the air falling from above, particularly during the loading and unloading steps. in addition, this configuration keeps all chemicals, and liquids and components in one location at the bottom of the reactor. Thus, during removal of the substrate, there is no accidental dripping of liquid on the newly cleansed or processed substrate. It will, of course, be appreciated that the chemicals must be placed under pressure in order to provide for the flow indicated by arrows 40." (Column 8, Lines 26-40)

The reference continues by teaching several processing steps widely recognized

as conventional operations within the field of semiconductor processing. Specifically , Example 1 teaches wafer cleaning, Example 2 teaches a photoresist development step, Example 3 teaches a silica etching step, and Example 4 teaches a resist stripping step (Column 12, line 25 to Column 13, line 67). Although the reference indicates that “many of the above operations (e.g. Example 1 through 4) can be done sequentially without removal of the wafer (from the fluid flow guides)” it does not explicitly require separate treatment units arranged side by side “along a carrying direction of the substrate” as claimed.

To this end, it is the Examiners position that providing a separate treatment unit (e.g. fig 2) for each of the disclosed conventional processing operations (examples 1 to 4) would be a merely obvious extension over the Cady teachings for one having an ordinary level of skill in the art of automated semiconductor processing (e.g. cassette-to-cassette process equipment). Specifically, this modification would be an obvious choice for anyone seeking to prevent cross contamination of sequential treatment fluids that may occur during sequential treatments in a single treatment unit. It would further be obvious, absent any compelling and unexpected results to the contrary, for one of ordinary skill to arrange these separate treatment units in any manner deemed most to the end user including “along a carrying direction of the substrate”.

### ***Response to Arguments***

Applicant's arguments filed January 9, 2007 have been fully considered but they are not persuasive. Regarding the application of Nakamura (US 6,921,148) to claims 1,

4, 6, and 8, Applicant argues that the reference fails to teach that the substrate is carried by the substrate carrier while the surface targeted for treatments of the substrate is facing downward and that the treatment units are operated upward. Examiner disagrees with the basis of Applicants arguments. Specifically, an apparatus is defined by what it is and not by its intended use. It is the Examiners position that the relative positioning of the apparatus elements are consistent with the structure of the apparatus claimed by Applicant. Further, Applicants arguments are directed to an intended use of the claimed continuous-treatment method and absent any unexpected results to the contrary the ultimate orientation of the apparatus during its use is understood to impart no substantial further limitation upon the structure of said apparatus.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Although not specifically utilized in the above art rejections, the United States patents to Aigo (US 4,339,297, US 4,600,463, and US 4,600,463) are all understood to teach treatment devices wherein the targeted surface faces down and the treatment device is operated upward as required by independent claims 1 and 6 .

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason L. Lazorcik whose telephone number is (571) 272-2217. The examiner can normally be reached on Monday through Friday 8:30 am to 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on (571) 272-1189. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JLL



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